DOI: 10.25121/PNM.2020.33.2.55 Post N Med 2020; XXXIII(2): 55-56

LETTERS TO THE EDITOR LISTY DO REDAKCJI

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Which technique of chest compression should we use wearing full personal protective equipment: a pilot data

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Keywords
chest compression, cardiopulmonary resuscitation, technique, COVID-19, SARS-CoV-2, pandemic, medical simulation, personal protective equipment

TO THE EDITOR

Out-of-hospital cardiac arrest (OHCA) is a leading cause of global mortality and is a challenge for the Emergency Medical Services Team (EMS) personnel due to limited human resources. Overall prognosis and the neurological outcome are relatively poor following OHCA. Reported survival to discharge after the onset of OHCA varies from 0 to 21% (1). In the era of the COVID-19 pandemic, due to the risk of transmission of SARS-CoV-2 coronavirus, the staff of the emergency exit teams should use enhanced personal protective equipment when performing medical rescue operations (including resuscitation) in a patient with suspected/confirmed COVID-19 (2). Full protective suits, masks with FFP2 or FFP3 filters as well as face shields or double gloves are most often recommended (3). The use of this type of protection may reduce the effectiveness of individual medical procedures (4-6) and thus reduce the effectiveness of resuscitation (7).

The aim of the study was to compare two different chest compression positions during suspected/confirmed COVID-19 adult cardiopulmonary resuscitation performed by paramedics wearing full PPE.

The study was designed as a prospective randomized crossover single-blinded trial and was conducted under medical simulation conditions. The trial was blinded at the statistical analysis stage. The trial involved 15 paramedics who had to perform 2-minute continuous chest compression using two techniques: taking the patient's side position (Technique A) and taking over the patient's head position (Technique B).

The paramedics performed chest compression while wearing a full ProChem I F suit protecting against organic and inorganic chemicals in high concentration and against particles below 1 μm diameter. To simulate a patient with suspected/confirmed COVID-19 requiring CPR, Resusci Anne Advanced Skill Trainer manikin (Laerdal, Norway) was used, which was placed on the floor in a brightly lit room. Both the order of participants and study methods were random. Research Randomizer (randomizer.org) was used to divide participants into two groups, with the first group starting chest compressions using Technique A and the second group Technique B. After a 2-minute CPR cycle, the study participants had a 30-minute break and then performed compressions using another method. A detailed randomization procedure is shown in figure 1. The statistical package STATISTICA 13.3EN (Tibco Inc., USA) was used for statistical analysis.

15 paramedics participated in the study. The average age was 32 ± 6.4 years, while the work experience in EMS was 7.2 ± 5.9 years. All participants were male and all have clinical experience in advanced resuscitation procedures. The mean depth of chest compressions in the studied Techniques varied and was 40 ± 3 mm with Technique A, and 43 ± 4 with Technique B (MD = -3.0; 95% CI: -5.53, -0.47; p = 0.02) respectively. Chest compression rate per minute (CPM) was higher for Technique A, 114 ± 12 CPM, and was statistically significantly higher than for Technique B, 105 ± 7 CPM (MD = 9.0; 95% CI: 1.97, 16.03; p = 0.01). For Technique A, the degree of complete chest relaxation was 34 ± 5% and for Technique B – 23 ± 11% (MD = 11.00; 95% CI: 4.89, 17.11; p < 0.001).

As the results show, cardiopulmonary resuscitation conducted in a protective suit in the position behind the

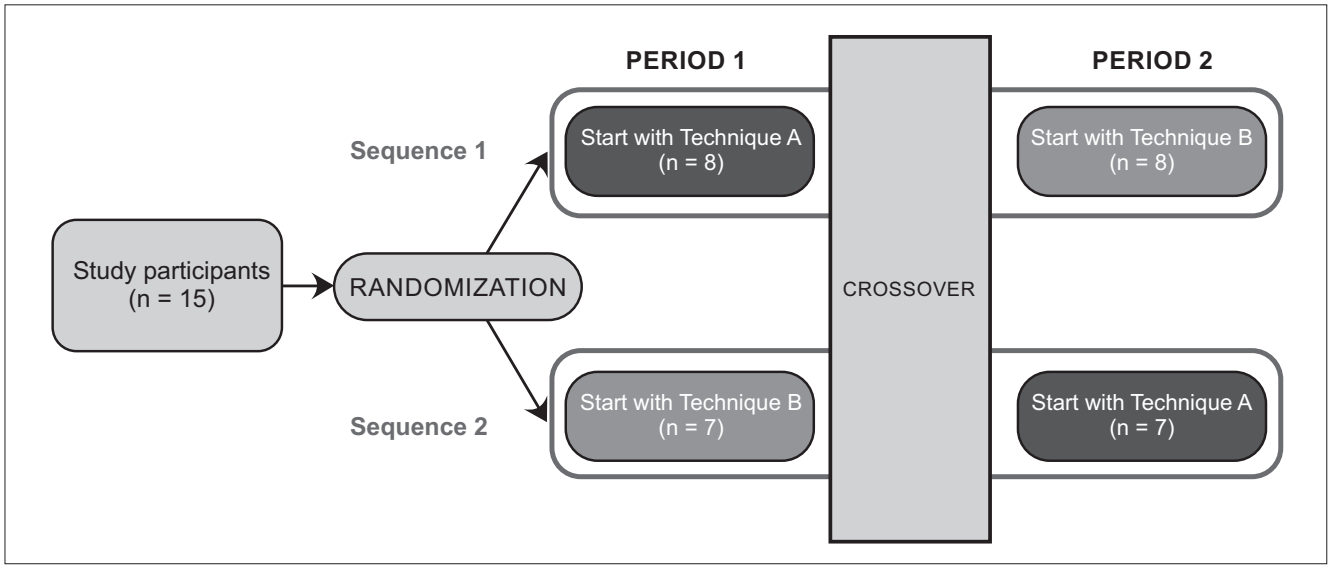

Fig 1. A detailed randomization procedure is shown

victim's head (Technique B) causes chest compressions to a greater depth but is associated with a lower degree of chest relaxation, which may be dictated by the rescuers leaning against the chest during resuscitation. Further research is needed to find the most effective method of chest compression concerning the conditions for performing COVID-19 resuscitation with suspected/confirmed COVID-19.

ACKNOWLEDGMENTS

Study supported by the ERC Research NET and Polish Society of Disaster Medicine.

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otrzymano/received: 03.04.2020
zaakceptowano/accepted: 24.04.2020